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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/767,925	01/23/2001	Kaius Kiiren Polikarpus	DP-300566	1447

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EXAMINER

OLSEN, KAJ K

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 04/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/767,925

Applicant(s)

POLIKARPUS ET AL.

Examiner

Kaj Olsen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32,36-45 and 48-55 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-32,36-45 and 48-55 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-32, 36-45, 48-55 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

3. Applicant has amended the various independent claims to specify that the percentage of monoclinic phase zirconia is based on the total weight of the zirconia-alumina body. This is in clear contrast to the originally filed disclosure, which indicated that the percentage of monoclinic phase zirconia was based only on the weight of the zirconia. See p. 5, lines 13-21 and originally filed claims 1, 16 and 34. This would appear to then be a clear change in the scope of the originally filed range and thereby constitutes new matter. The examiner will concede that a number of the zirconia-alumina bodies disclosed in the specification would presumably overlap the new specified range of claims 1, 16, 38, 42, 51 and 55 because the amount of alumina in the bodies is low (e.g. p. 5, lines 16-18). However, the issue is not whether the applicant ever specified anything in that range, but rather did the applicant specify the actual range itself. On that issue, it doesn't appear the applicant ever specified that the monoclinic zirconia should be 1 to 45% of the weight of the total zirconia-alumina body.

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Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1, 4, 6-18, 20-22, 25-32, 36, 37, 43-50, and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugiyama et al (USP 6,258,233) in view of Noda et al (US 2003/0006139 A1).

7. With respect to claim 1, Sugiyama discloses a method of manufacturing a zirconia-alumina body that comprises mixing zirconia, yttria, and at least one solvent to form a mixture (col. 7, lines 48-56). Said mixture is dried (col. 7, line 60) and disposed adjacent to an unfired alumina body (13 and/or 16) and the zirconia and the alumina bodies are co-fired together (col. 8, lines 11-19 and lines 34-38). The zirconia utilized by Sugiyama comprises a percentage of

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monoclinic phase, as measured from the diffraction intensities, that varies between 5 and 25 % based on the total weight of zirconia (col. 2, lines 38-50).

8. Sugiyama does not explicitly suggest also including alumina to the zirconia mixture, Noda teaches in an alternate method for preparing zirconia for electrochemical sensors that adding alumina to the zirconia mixture allows one to better match the thermal expansion of the electrolyte to the other substrates thereby minimizing cracking (paragraphs 0006, 0007, and 0022). It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Noda for the method of Sugiyama in order to minimize laminate cracking.

9. With respect to the amended claims requiring the percentage of monoclinic zirconia to be based on the total weight of zirconia and alumina, Noda teaches utilizing as little as 10% of alumina (see abstract). Moreover, Noda acknowledged that adding less than 5% alumina was already old in the art (see paragraph 0010). Hence, if Sugiyama (which taught the use of upwards of 25% monoclinic zirconia) were modified with either 10% alumina or less than 5% alumina, the references would still read on the modified monoclinic ranges. For example, if Sugiyama utilized 10% alumina, its 25% monoclinic number would drop to only 22.5% and that still reads on the claimed 1-45% range.

10. With respect to the claimed level of silicon impurities, see claim 25 of Noda, which teaches the use of zirconia having less than 100 ppm of total impurities.

11. With respect to claims 4, 7, and 8, see Sugiyama, col. 7, lines 55-57.

12. With respect to claim 6, Sugiyama particularly teaches the use of compositions between 18 and 25 % monoclinic (fig. 13 and tables 1-3).

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13. With respect to claim 9, although neither Sugiyama nor Noda specify a particular sintering mismatch, this would appear to the examiner to be a function of the percentage of monoclinic zirconia utilized for the body (as taught by Sugiyama) and/or the addition of alumina to the mixture (as taught by Noda). Hence the method as set forth above would inherently produce a laminated mixture and alumina surface having the claimed mismatched. In addition, the teaching of Noda is drawn to the concept of minimizing the mismatch that results in cracking.
14. With respect to claims 10 and 11, see Sugiyama, col. 13, lines 19-22.
15. With respect to claim 12, see Sugiyama, col. 7, line 54.
16. With respect to claims 13 and 14, Sugiyama teaches the use of 6 mol% yttrium oxide (col. 7, lines 50 and 51) and Noda teaches the use of both 5 and 10% by weight of Al_2O_3 (paragraphs 0010 and 0011)
17. With respect to claim 15, see Sugiyama, col. 7, line 65 through col. 8, line 3.
18. With respect to claim 16 (those limitations not covered above for claim 1), Sugiyama teaches disposing an electrode onto each side of the unfired zirconia body and connecting each electrode to an electrical lead (col. 7, line 65 through col. 8, line 3).
19. With respect to claim 17, see paragraph 0099 of Noda.
20. With respect to claim 18, layers 16 and 22 would constitute support layers and a heater 25 is disposed within the support layers (fig. 1).
21. With respect to claims 20-22 and 25-32, see the previous rejections for claims 6, 6, 4, and 7-14 respectively.

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22. With respect to claims 36, 37, and 43-50, Noda not only taught the use of high purity zirconia and yttria for the electrolyte (see rejection for claim 1), but also taught the use of high purity alumina as well (paragraph 0016-0018). With respect to the claimed resistivity of the electrode, it would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize said low resistivity in order to increase the signal to noise for the sensor.

23. Claims 2, 3, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugiyama in view of Noda as applied to claims 1 and 22 above, and further in view of Aizawa et al (USP 5,968,673).

24. The references set forth all the limitations of the claims, but did not explicitly set forth the presence of a dispersant in the mixture. Aizawa teaches in an alternate solid electrolyte construction that adding a dispersant to a ceramic mixture (i.e. slurry) improves the dispersion of the particles in the slurry allowing for a more homogeneous mixture (col. 4, lines 20-27). It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of a dispersant in order to create a homogeneous mixture of the electrolyte particles. With respect to the concentration of monoclinic zirconia in the zirconia-alumina, see the rejection for claim 6 above. With respect to the particular composition of the dispersant, Aizawa teaches the use of a phosphate ester (col. 4, lines 26 and 27).

25. Claims 5 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugiyama in view of Noda as applied to claims 1 and 22 above, and further in view of Wang (USP 4,897,174).

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26. The references set forth all the limitations of the claims, but did not explicitly recite the step of de-airing the mixture. Wang teaches in an alternate electrochemical sensor construction that exposing a ceramic mixture (i.e. a slurry) to a vacuum (i.e. de-airing) ensures that the slurry possesses no trapped air (col. 3, lines 32-34). It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Wang for the method of Sugiyama and Noda in order to ensure that there is no trapped air in the mixture.

27. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sugiyama in view of Friese as applied to claim 18 above, and further in view of Lankheet (USP 6,346,178).

28. The references set forth all the limitations of the claim, but did not explicitly recite the presence of a ground plane between the heater and the alumina body. Lankheet teaches in an alternate electrochemical sensor that the inclusion of a ground plane 42 can prevent the premature failure of the heater (col. 4, lines 52-64). It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Lankheet for the method of Sugiyama and Noda in order to prevent the premature failure of the heater.

Allowable Subject Matter

29. The indicated allowability of claims 38-41 and 51-54 is withdrawn in view of the inclusion of new matter into claims 38 and 51.

Response to Arguments

30. Applicant's arguments filed 1-21-2004 have been fully considered but they are not persuasive. Applicant requests the examiner now consider 09/741,498 because it has now published. However, the examiner still cannot consider the 09/741,498 because it is not per se a U.S. Patent Document. For the applicant's benefit, the examiner has indicated consideration of USP 6,562,747 on the enclosed PTO-892.

31. Applicant's arguments about the rejection over Sugiyama and Noda is that neither reference teaches all the elements of the claims. This is correct, but the rejection was based on a combination of the two teachings. In short, Sugiyama taught the claimed percentage of monoclinic zirconia and Noda taught the advantages of adding a small amount of alumina to the electrolyte to improve its properties. In fact, Noda indicated that adding even smaller amounts of alumina to the electrolyte was old in the art (paragraph 0010). Hence one possessing ordinary skill in the art would have been motivated to add a small amount of alumina to the electrolyte of Sugiyama to improve its thermal and mechanical properties.

32. Applicant's other arguments concerning the rejections over Aizawa and Wang appear to rely on their belief of the inadequacies of Sugiyama and Noda. Because these arguments were not persuasive, the other rejections remain as well.

Conclusion

33. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaj Olsen whose telephone number is (571) 272-1344. The examiner can normally be reached on Monday through Thursday from 6:30 A.M. to 4:00 P.M. and on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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A handwritten signature in black ink, appearing to read 'Kaj Olsen', with a long horizontal flourish extending to the right.

Kaj Olsen Ph.D.
Primary Examiner
AU 1753
April 2, 2004